

REMARKS

Please reconsider this application in view of the above amendments and the following remarks. Applicant thanks the Examiner for carefully considering this application, and deeming that claims 5 and 6 contain allowable subject matter.

Disposition of Claims

Claims 1-20 were pending in this application. Claims 1-20 were canceled without prejudice or disclaimer. New claims 21-36 were added. Claims 21, 31, 33, and 35 are independent. The remaining claims depend, directly or indirectly, on claims 21, 31, 33 and 35. Support for independent claim 35 may be found, for example, in Fig. 10 of published application. Support for claim 36 may be found, for example, in paragraph [0107] of published application. Support for claims 21-34 may be found, for example, in original claims 1-20.

Independent claim 21 corresponds to claim 1 together with the limitations of allowed original claim 5.

Claim 22 corresponds to allowed claim 6, with the dependency changed to claim 21.

Claims 23-25 correspond to claims 2-4, with the dependencies changed to claim 21.

Claims 26-27 correspond to claims 16-17, with the dependencies changed to claim 21.

Claim 28 corresponds to claim 18, with the dependency changed to claim 27.

Claims 29-30 correspond to claims 19-20, with dependencies changed to claim 28.

Independent claim 31 corresponds to claim 1 together with the limitations of claim 9.

Claim 32 corresponds to claim 10, with the dependency changed to claim 31.

Independent claim 33 corresponds to claim 11, and claim 34 corresponds to claim 12, with the dependency changed to claim 33.

Therefore, claims 21-36 are currently pending. Claims 21 and 22 contain allowable subject matter, as they correspond to original claims 5 and 6, respectively. No new matter has been added by way of these amendments.

Objection(s) to Drawings

Figs. 16, 17, 18A, 18B, 18C, and 19 stand objected to for not being designated by a legend such as Prior Art. As per the Examiner's comments, Figs. 16, 17, 18A, 18B, 18C, and 19 were labeled as Prior Art. Accordingly, withdrawal of this objection is respectfully requested.

Rejection under Double Patenting

Claims 1, 2, and 16-20 stand provisionally rejected on the ground of non-statutory obviousness-type double patenting as being unpatentable over claims 1, 2, 7, 9, and 10 of co-pending Application No. 10/ 574,253. A terminal disclaimer, compliant with 37 CFR 1.321, has been included to obviate the Double Patenting. Accordingly, withdrawal of this rejection is respectfully requested.

Rejection(s) under 35 U.S.C. § 102

Claims 1-4, and 16-19 stand rejected under 35 U.S.C. §102(b) as being anticipated by Applicant's Admitted Prior Art (AAPA). Claims 1-20, as discussed above, have been canceled without prejudice or disclaimer. Accordingly, this rejection is now moot. However, to the extent that this rejection may still apply to the new claims, this rejection is respectfully traversed.

Claim 21 corresponds to claim 1 together with the limitations of allowed claim 5. Additionally, Applicant respectfully notes that the Examiner has misinterpreted [0006] of the published application in conjunction with Fig. 17 by concluding that the quantity of strain at the position where the first strain gauges are disposed (Fig. 17, R512 & R513; R522 & R523; R532 & R533) is smaller than the quantity of strain at the position where the second strain gauges are disposed (Fig. 17, R511 & R514; R521 & R524; R531 & R534). Paragraph [0006] clearly states that the largest strain is generated at the inner edge where the first strain gauges are disposed.

Consequently, claim 21 is not anticipated by AAPA. Claims 23-25, which are directly dependent on claim 21, and claims 26-29, which are directly or indirectly dependent on claim 21, are also not anticipated for at least the same reasons. Accordingly, entry and favorable consideration of the new claims is respectfully requested.

Claim 13 stands rejected under 35 U.S.C. §102(b) as being anticipated by Japanese Patent Publication No. JP 03-20635 ("Kabushiki"). Claim 13 has been canceled without prejudice or disclaimer. Accordingly, this rejection is now moot. Furthermore, no new claims directly correspond to claim 13.

Claims 1, 7, 8, and 14 stand rejected under 35 U.S.C §102(b) as being anticipated by Japanese Patent Publication No. JP 2514974 ("Enplas"). Claims 1, 7, 8, and 14 have been canceled without prejudice or disclaimer. Accordingly, this rejection is now moot. Furthermore, no new claims directly correspond to these claims.

Claims 1, 9, 10, and 15 stand rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,595,063 ("Rogne et al."). Claims 1, 9, 10, and 15 have been canceled without prejudice or disclaimer. Accordingly, this rejection is now moot. Furthermore, no new claims directly correspond to claims 1 or 15.

Original claim 9 has been rewritten with original claim 1 as independent claim 31. Original claim 10 is now claim 32, with the dependency on claim 31. To the extent that this rejection may apply to the new claims, the rejection is respectfully traversed.

Rogne et al. disclose a pressure sensor element comprising a connecting portion between a central membrane 4 and a second membrane 2. The Examiner construes the frame 3 as equating to the fixed portion of original claim 9, and the first and second membranes (1 and 2) to be the interconnecting portion. The first connecting portion between the alleged force receiving portion 4 and the interconnecting portion 2 has a 90° curvature (*see* Fig. 3A). However, the Examiner further construes that the alleged second connecting portion between the fixed portion 3 and the interconnecting portion 1 has a curvature greater than 90°, as required by original claim 9 and now new independent claim 31.

In stark contrast, the alleged second connecting portion has a curvature less than 90°, i.e., smaller than the predetermined curvature of the first connecting portion. This is the opposite of

the curvature limitation of the sensor defined in claim 31 of the present application (*see* Fig. 8 of published application for comparison). Applicant respectfully asserts that the Examiner has misinterpreted the angle between two surfaces to be the curvature.

In view of the above, Rogne et al. do not show or suggest at least "wherein a connecting portion between the force receiving portion and the interconnecting portion has a predetermined curvature, and a connecting portion between the fixed portion and the interconnecting portion has a curvature larger than the predetermined curvature," as required by new claim 31. Claim 31 is, therefore, not anticipated by Rogne et al. Dependent claim 32 is also not anticipated for at least the same reasons. Accordingly, entry and favorable consideration of the new claims is respectfully requested.

Claims 1, 17, 18, and 20 stand rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 3,456,226 ("Vick"). Claims 1, 17, 18, and 20 have been canceled without prejudice or disclaimer. To the extent that this rejection may still apply to the new claims, this rejection is respectfully traversed.

The disclosure of Vick is directed to piezoresistive force transducers that utilize a plurality of piezoresistive strain gauge elements (*see, e.g.*, col. 1, lines 29-31). As discussed above, claim 21 corresponds to claim 1 together with the limitations of allowed claim 5. Vick, as admitted by the Examiner, fails to show or suggest all of the limitations of allowed claim 5. Thus, Vick does not anticipate or render obvious new independent claim 21. Claims 27, 28, and 30, which are directly or indirectly dependent on claim 21, are also not anticipated for at least the same reasons. Accordingly, entry and favorable consideration of the new claims is respectfully requested.

Rejections under 35 U.S.C. § 103

Claims 11 and 12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over AAPA in view of a May 2000 Sensors Journal paper ("Johnston et al."). Claims 11 and 12 have been canceled without prejudice or disclaimer. Accordingly, this rejection is now moot. However, Independent claim 33 corresponds to claim 11 and claim 34 corresponds to claim 12. To the extent that this rejection may apply to the new claims, this rejection is respectfully traversed.

Applicant respectfully asserts that the Examiner has improperly combined AAPA with the teachings of Johnston et al. in this rejection. AAPA discloses a strain gauge type sensor 500 as shown in Fig. 16 of published application. When a force or moment is applied, the strain generated at the outer edge of the diaphragm portion 513 on the corresponding axis is extremely smaller than the strain generated at the inner edge of the diaphragm portion 513 (*see, e.g.*, [0006] of published application). This leads to a problem of reduced sensitivity of the sensor, which is precisely the problem the claimed invention overcomes.

In order to achieve increased sensitivity, the first strain gauge is shorter than the second strain gauge disposed on the interconnecting portion at a position nearer to the fixed portion than the first strain gauge. This allows for the difference in the quantity of resistance value change to be decreased between the first and second strain gauges.

Therefore, the claimed invention sets out to overcome a problem of AAPA, i.e., the problem of reduced sensitivity. The Examiner also admits that AAPA does not show or suggest the first strain gauge is shorter than the second strain gauge.

Applicant respectfully asserts that combining AAPA with Johnston et al. would destroy the teachings of AAPA. This is because AAPA teaches that the first strain gauges (R512 & R513; R522 & R523; R532 & R533 of Figs. 18a-c) change widely in their resistance values and the second strain gauges (R511 & R514; R521 & R524; R531 & R 534 of Figs. 18a-c) change little in their resistance values (*see, e.g.*, paragraph [0007] of published application) and the cited Japanese Patent Publication No. JP 04-194634 (hereinafter "Morimoto") in paragraph [0005] of published application is focused on improving detection accuracy by connecting detecting elements in series with predetermined intervals (*see* Abstract of Morimoto). Johnston et al. was cited as showing "trimming strain gauges in a Wheatstone bridge in a load cell" (see Office Action dated 02/29/08, page 10).

Accordingly, if these teachings were combined, then the AAPA detecting elements would be rendered inoperable. Claim 33 is, therefore, patentable over AAPA in view of Johnston et al. Claim 34, directly dependent on claim 33 is also patentable for at least the same reasons. Accordingly, entry and favorable consideration of the new claims is respectfully requested.

New Claims 35 and 36

New claims 35 and 36 are also patentable over all of the cited references for at least the same reasons set forth above.

Conclusion

Applicant believes this reply is fully responsive to all outstanding issues and places this application in condition for allowance. If this belief is incorrect, or other issues arise, the Examiner is encouraged to contact the undersigned or his associates at the telephone number listed below. Please apply any charges not covered, or any credits, to Deposit Account 50-0591 (Reference Number 07700/073001).

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Respectfully submitted,

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Attachments: Replacement Drawings (5 sheets; 6 figures)

Terminal Disclaimer (1 page)